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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,278	01/11/2006	Toru Shiraishi	126615	8044
25944 7590 04/22/2009 OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850				
EXAMINER				
SAVAGE, JASON L				
ART UNIT		PAPER NUMBER		
1794				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/564,278

**Applicant(s)**

SHIRAIISHI ET AL.

**Examiner**

JASON L. SAVAGE

**Art Unit**

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)  
Paper No(s)/Mail Date 20090409
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rivers (US 6,148,785) in view of either Stoppek (JP 2002-267015 English Machine Translation) or Imamura et al. (JP 62-067221).

Rivers teaches a reinforcing members formed from carbon-carbon material are known for use as cast or molded parts such as pistons, cylinder liners and cylinder blocks (col. 4, ln. 33-67). Rivers teaches that forming the parts from the recited composite materials can serve to reduce the weight of the components, improve engine efficiency as well as other benefits (col. 3, ln. 1-20). Rivers further teaches that the reinforced member such as a piston may comprise several plies of reinforcing carbon fabric or tape (col. 5, ln. 22-27). Regarding the limitation that the reinforcing member is integrally cast with a cast metal; although Rivers does not explicitly recite that a cast metal is integrally cast with the reinforcing carbon plies, Rivers teaches that carbon-carbon reinforcing composites are well known in the art and may be cast or molded (col. 4, ln. 33-45). As such it would have been obvious to one of ordinary skill in the art at the time of the invention to have cast a cast metal with the reinforcing carbon plies to form a component such as a piston since Rivers teaches that such a combination is well

known. The thus formed composite reinforcing member would meet the limitation wherein the carbon plies is a material different from the cast metal.

Regarding the limitation that a hollow portion that is a closed space having no member therein is formed in the reinforcing member, Rivers does not exemplify the claimed structure. However, it is known in the art that to provide hollow portions in components such as pistons so as to provide weight reduction as well as thermal insulation.

Imamura teaches a piston component wherein a top surface **20b** and bottom surface **20a** are provided to form a closed hollow portion **20** which provides the piston with reduced weight and thermal insulation (abs).

Stoppek teaches a piston component wherein a top surface **14** and bottom surface **12** are provided to form a closed hollow portion **18** which provides the piston with reduced weight (abs and Figure 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have formed hollow portions within the piston component of Rivers such as described by Imamura and Stoppek in order to produce a reinforced piston member which is further reduced in weight with a reasonable expectation of success. With respect to the limitation that the hollow portion is closed, the piston of Rivers so modified would meet the claim limitation.

Regarding claim 2, Rivers teaches the use of a stacked structure for the reinforcing member and applying members on the surface of the stack to cover and close the hollow portion would have been obvious.

Regarding claim 3, Rivers teaches that a porous surface layer may be applied so as to soak of lubricating materials (col. 3, ln. 7-20).

Regarding claim 4, although Rivers is silent the fibrous material in the porous body comprising a metal fiber, it would have been obvious to one of ordinary skill to have added other component materials to the reinforcing member including other fibers such as metal fibers in order to tailor the properties of the composite to reduce weight and minimize any thermal distortion in the component.

Regarding claim 5, Rivers does not teach that the reinforcing composite is used as a journal portion. However, Rivers teaches that the reinforcing composites are suitable for a variety of components in an engine block (col. 2, ln. 56-67). As such, it would have been obvious to one of ordinary skill in the art to have formed other components for the engine with the recited reinforcing material in order to reduce the weight and thermal distortion.

Regarding claims 6-8, the claimed method of casting a cast metal into the stack of reinforcing material and subsequently applying surface layer coverings by laminating and covering with a porous surface layer would have been an obvious method of forming the composite of Rivers in view of Imamura and Stoppek.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-8 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues that Rivers does not render the amended claim limitations of the hollow portion being a closed space having no member therein as being obvious. However, the claim limitations are considered to be obvious in view of the modified rejection above.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON L. SAVAGE whose telephone number is (571)272-1542. The examiner can normally be reached on M-F 6:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jason Savage/  
Examiner  
4-13-09

/JENNIFER MCNEIL/  
Supervisory Patent Examiner, Art Unit 1794